

We Claim:

1. A system for registering two dimensional image data to intra-operatively digitized landmarks obtained during a joint arthroplasty procedure on a patient having a joint in need of such a procedure comprising:

a surgical navigation system capable of determining a position and an orientation of an object within a working volume, including a central processing unit, a display, a memory unit and a storage unit;

a first circuit to import the two dimensional image data for the joint into the memory unit;

a second circuit to perform an intra-operative anatomical survey of the joint and an associated limb to digitize selected landmarks and to determine a mechanical axis for the limb;

a third circuit to register the two dimensional image data to the mechanical axis and display the registered two dimensional image data on the display; and

a fourth circuit to assist in guiding a cutting jig into position within the joint based on the landmarks while showing the registered two dimensional image data in relation to the landmarks, wherein the position and the orientation of the cutting jig can be tracked by the surgical navigation system.

2. The system of claim 1 wherein the fourth circuit displays the position of the cutting jig on the display relative to the registered two dimensional image data.

3. The system of claim 1 wherein the fourth circuit also displays a modified image based on the registered two dimensional image data showing a resection plane of a bone within the joint.

5. The system of claim 1 wherein the two dimensional image data is obtained intra-operatively.

6. The system of claim 1 wherein the system includes a fifth circuit that performs an initial kinematic assessment of the joint.

7. The system of claim 6 wherein the third circuit also registers the image data to the digitized landmarks, and to the kinematic assessment.

8. The system of claim 1 wherein the fourth circuit also displays digitized landmarks along with the registered two dimensional image data.

9. The system of claim 1 wherein the fourth circuit also displays a proposed resection plane on the registered two dimensional image data.

10. The system of claim 1 wherein the fourth circuit also displays the varus/valgus data and the extension/flexion data.

11. A method for registering two dimensional image data to intra-operatively digitized landmarks obtained during a joint arthroplasty procedure on a patient having a joint in need of such a procedure, the method comprising the steps of:

importing the two dimensional image data for the joint into memory of a surgical navigation system capable of determining the position and orientation of an object within a working volume wherein the surgical navigation system includes a display, a central processing unit and storage;

performing an anatomical survey of the joint and an associated limb;

digitizing selected landmarks based on the anatomical survey;

determining a mechanical axis for the limb based on the digitized landmarks;

registering the two dimensional image data to the mechanical axis and displaying the registered image data on the display; and

guiding a cutting jig into position within the knee joint using the surgical navigation system based on the landmarks.

12. The method of claim 11 including the additional step of displaying the position of the cutting jig on the display relative to the registered two dimensional image data.

13. The method of claim 11 including the additional step of displaying a modified image based on the two dimensional image data showing a resection of a bone within the joint.

14. The method of claim 11 wherein the two dimensional image data is obtained pre-operatively.

15. The method of claim 11 wherein the two dimensional image data is obtained intra-operatively.

16. The method of claim 11 including the additional step of performing an initial kinematic assessment of the joint.

17. The method of claim 16 wherein the two dimensional image data is also registered to the digitized landmarks, and to the kinematic assessment.

18. The method of claim 11 wherein the digitized landmarks are displayed along with the registered two dimensional image data.